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ABSTRACT

The College of Education, University of Missouri-Columbia is developing and testing a suite of tools that utilize the Internet and work as a system to support learning from field experiences. These tools are built to support preservice teachers, field-based mentors, and college faculty as they collaborate, engage in practice, document their efforts, share their experiences, and assess outcomes. The journal system enables preservice teachers to record their observations and reflections about experiences, maintain these records on a central server, and organize the records to meet a variety of needs. Among the resource types are World Wide Web pages, electronic messaging, and conferencing. The field test version of the journal system will implement a Macintosh client and Silicon Graphics Indy servers. The clients and servers communicate on the Internet using TCP/IP connections. Three figures present the opening screen, a journal entry, and an author profile. (Author/DLS)

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Building Internet-Based Electronic Performance Support for Teaching and Learning

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Abstract: The College of Education, University of Missouri-Columbia is developing and testing a suite of tools that utilize the Internet and work as a system to support learning from field experiences. These tools are built to support pre-service teachers, field-based mentors and college faculty as they collaborate, engage in practice, document their efforts, share their experiences, and assess outcomes. The journal system enables the preservice teacher to record their observations and reflections about experiences, maintain these records on a central server, and organize the records to meet a variety of needs. Among the resource types are web pages, electronic messaging and conferencing. The field test version of the journal system will implement a Macintosh client and Silicon Graphics Indy servers. The clients and servers communicate over the internet using TCP/IP connections.

Introduction

Educational and training organizations are moving away from sole reliance upon classroom teaching models and toward supporting learning in the context of authentic practice and work experiences. Technology is viewed as scaffolding for performance and an enabler of communication and feedback for learning. Gloria Gery [Gery 1991] coined the term electronic performance support systems (EPSS) for systems which provide on-demand access to integrated information, guidance, advice, assistance, training, and tools to enable high level job performance with a minimum of support from other people. For Gery the goal of an EPSS is to provide whatever is necessary to generate successful performance and learning at the moment of need. Critical to this work is to design the resources to fit the work.

Organizations justify EPSS as a means for building and insuring worker competence in the face of new competitive environments with increasingly difficult job demands, rapidly changing knowledge bases, and inadequate training systems. Inherent in this approach is the recognition that simply improving training or doing more training is not adequate. Organizations need a new approach to building and supporting competency in the work place and have been turning to EPSS. We see many parallels between the needs of the knowledge workers in the organizations that have been adopting EPSS and the needs of the teacher as they support new forms of learning in educational environments. Teachers and learners in educational settings need opportunities to put knowledge and skills to work in authentic, field-based projects. Success in these situations calls for teachers and students being resourceful in ways never imagined in the past and also being supported as they make sense of feedback and reflect on their experiences. The feedback from efforts and the reflection process are indeed the most significant products of the educational product.

Based on research and development undertaken at Apple Computer, support systems can augment the processes of taking on new challenges, sharing resources and being guided to successful performance.

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[Laffey, 1995] articulated the characteristics of a dynamic support system as the ability to change with experience, to be updated and adjusted by the performer, and to augment other resources found in the performer's community. New models for education require that the support system also facilitate reflection.

An Internet-Based Support System

We envision Internet-based tools as a new form of EPSS, creating new performance and learning spaces which augment communities of practice. The Internet provides the potential of wide access and links to many types of dynamic and evolving resources. The Internet, however, has some limitations for supporting EPSS. Internet-based tools typically allow a community to create an accessible information space which is a starting point for our design of a performance and learning space. By information space we generally mean a place for the storage and retrieval of information -- to support information requests. By performance and learning space we mean a place for the storage, retrieval, *processing* and *reflection* upon information and experience -- to support requests which come in the context of planning a task, solving a problem, making a decision, trying a new technique or strategy, or assessing outcomes. In some instances the difference may be as subtle as the quality achieved by user-centered design for demanding users [Sellers, 1994]. In other instances it may be illustrated by new types of software designed for specific processes encountered during the performance [Gallopoulos, Houstis, Rice, 1994]. To this end the performance and learning space for supporting teaching and learning in authentic, field-based projects should include tools for managing and monitoring the complexity of projects (goals, milestones, time frames, resources, multimedia artifacts, etc.) and for building the students' skills and capacity for taking on and being successful at projects.

We are developing an interactive journal system for supporting students, field-based mentors and college faculty as they collaborate, engage in practice, document their efforts, share their experiences, and assess outcomes. The first version of the journal software enables the student-teacher to record observations and reflections about experiences, maintain these records on a server, and organize the records to meet a variety of needs. The software also facilitates sharing these records with faculty, mentor teachers and other student-teachers. In addition the software provides access to a variety of resources for enhancing experiences and solving problems. Among the resource types are on-line archives of knowledge about teaching and learning, links to other appropriate on-line archives, references to off-line support material, and electronic messaging and conferencing. A key aspect of the design and development work will be to implement support for encouraging and improving students processes of reflection upon their experiences.

Software Description

The first version of the journal system will implement a Macintosh client and Silicon Graphics Indy servers. The clients and servers will communicate over the internet using TCP/IP connections. Anyone who has access to the internet via a direct connection or a SLIP or PPP connection will be able to participate. In addition the software will support the creation and editing of journal entries off-line for later upload when a connection is available.

In addition to the features and functions that are supplied by the journal system client connection with the journal system server, the software integrates both web-browsing and e-mail for a full-functioned environment that supports communication and collaboration with the central mechanism being the shared journal. The following categories of functions and features are being implemented in the journal system:

- the creation and editing of multimedia journal entries. In the first version text, images, and web links will be supported. In the following version audio and video will be supported.

- the sharing of journal entries with other members of the community

- the ability to add comments and feedback to a journal entry

- the designation of tasks that a member of the community is to complete. For example, a mentor at the university may ask a pre-service teacher to make observations of a class and write pre-observation, observation, and post-observation journal entries

- access to informative and instructional resources: web pages, documents, and software

- access to e-mail within the journal client

- access to a web-browser within the journal client

- a multi-way text chat facility for real-time interaction from the journal client

- access to news and information that is important to the community of users

Figure 1 shows the basic tools available to students once they have signed onto the system. The tools include access to their own journal entries, access to journal entries from others and an In Box for notification about comments from others or newly assigned tasks. The other tools allow easy access to internet-based resources and communication tools.

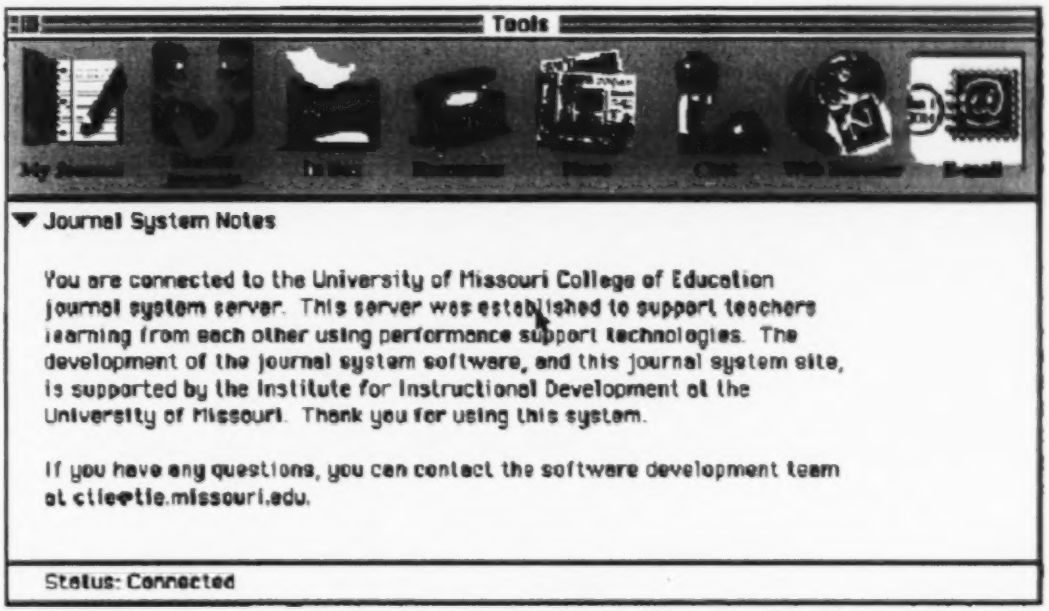
Tools
Journal System Notes
You are connected to the University of Missouri College of Education journal system server. This server was established to support teachers learning from each other using performance support technologies. The development of the journal system software, and this journal system site, is supported by the Institute for Instructional Development at the University of Missouri. Thank you for using this system.
If you have any questions, you can contact the software development team at ctleetie.missouri.edu.
Status: Connected

Figure 1: Opening screen

The journal entry screen (Fig. 2) enables the student to create a journal entry which can include imported graphics and links to URLs. The student can also view notes appended by the teacher and other students to the journal entry. The journal editor is designed to support and promote reflection; reflection is a key attribute of the journal writing activity. The reflection button takes evokes suggestions and mechanisms for reviewing your entry and thinking "deeper" about its meaning and significance. The editor allows the student teacher to import and acquire "live" media elements. The editor also support working in a networked environment for submitting entries to the server or working off-net with the capability of saving work to a hard drive for sending to the server when a connection can be made. The entry form allows the student to identify keywords to support search strategies and to set access rights to be public, private or to select groups.

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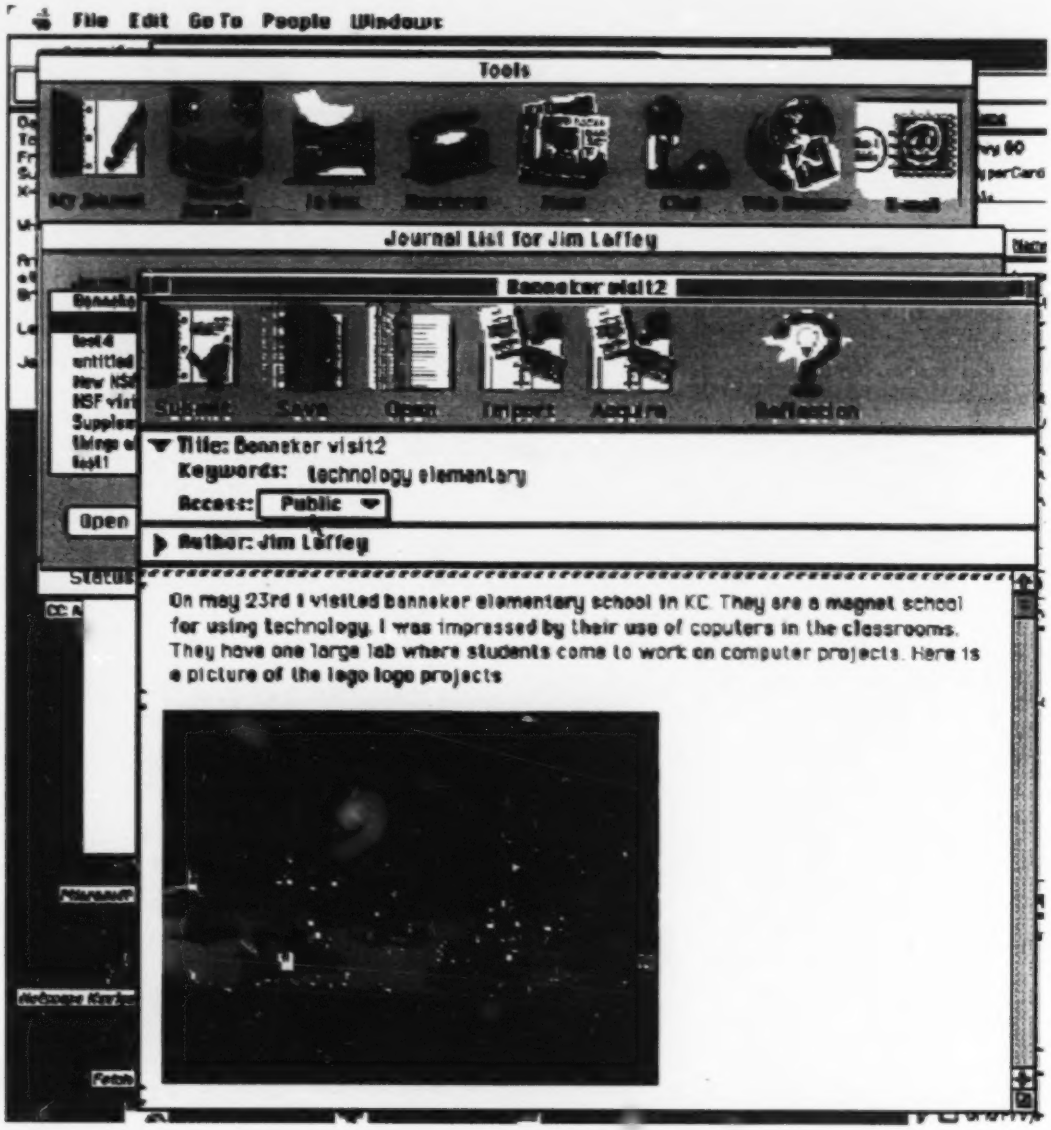
File Edit Go To People Windows
Tools
Journal List for Jim Laffey
Banneker visit2
Submit
Save
Open
Import
Acquire
Reflection
Title: Banneker visit2
Keywords: technology elementary
Access: Public
Author: Jim Laffey
On may 23rd I visited banneker elementary school in KC. They are a magnet school for using technology. I was impressed by their use of coputers in the classrooms. They have one large lab where students come to work on computer projects. Here is a picture of the lego logo projects
Open

Figure 2: Journal entry

The journal system enables a shared set of documents for collaboration and reflection. the system is also intended to facilitate a shared community of educational practitioners for shared professional development. Much of the communications infrastructure is intended to support this goal. The journal system integrates the communication tools. Figure 3 which shows a profile of an author illustrates this integration by showing how from this profile one can access the author by using a preaddressed email, locating the authors home page, entering the authors journal or (if the author is on-line) connecting for a chat session. These communication functions enable a dynamic, interactive environment for learning and development.

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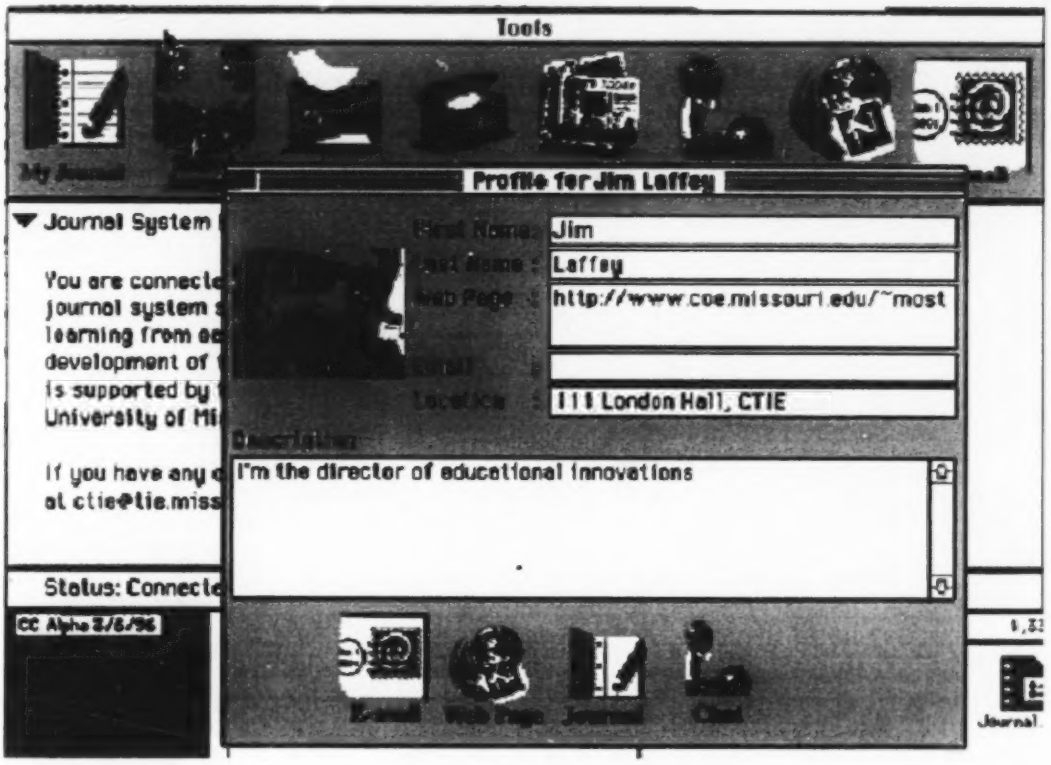

Figure 3: Author profile

Conclusions

The shared journal systems provides an opportunity for new forms of teaching and learning, forms which provide support for learning by doing and for working in the performance environment (typically outside the college classroom). These new forms of teaching and learning have much in common with electronic performance support systems which are now being implemented in business and industry. Technology can be an aid to improved human competency and performance by providing support for articulation, communication, processing, analysis, and reflection on human experience. The ISJS implements this type of support structure and offers great potential for bringing dynamic support systems to bear on the problems of aiding and improving human performance.

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